

COPY**Claims**

1. A modulator for use in gas chromatographic analysis, adapted for alternatively trapping and releasing fractions of solutes in a length of a capillary column within a chromatographic oven, characterized in that it comprises at least one nozzle placed to spray at least one jet in at least one corresponding place along said capillary column length, said nozzle(s) being connected each to a source of liquid CO₂ via a related valve, and means for alternatively opening said valve(s) for a predetermined time, to cause a jet of liquid CO₂ to impinge for said predetermined time on said column place and to leave the oven atmosphere to heat said column place after said predetermined time.
2. A modulator according to claim 1, characterized in that said valve(s) is (are) alternatively opened for a predetermined time within a given cycle time and in that said column place is heated by the oven atmosphere during the remaining cycle time.
3. A modulator according to claim 2, for trapping and releasing in sequence fractions of solutes, characterized in that it comprises at least two nozzles placed to spray liquid CO₂ jets in at least two corresponding separated places along said capillary column length, and means for alternatively opening said valves each for a predetermined time in sequence within a given cycle time, to cause each jet of liquid CO₂ to impinge for said predetermined time on the corresponding column place and to leave the oven atmosphere to heat said column place during the remaining cycle time.
4. A modulator according to claim 3, wherein said predetermined time is the same for all valves.
5. A modulator according to claim 3, wherein said predetermined time is different for at least two of said valves.
6. A modulator according to claim 4 or 5, wherein said predetermined

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time is ranging from about 0.1 seconds to about 30 seconds.

7. A modulator according to one of claims 4, 5 or 6, wherein said cycle time is the sum of the predetermined times of all valves.

8. A modulator according to one of the claims 2 to 7, wherein said cycle time is ranging from about 0.1 seconds to about 30 seconds.

9. A modulator according to one of the preceding claims, wherein each said nozzles has an opening in the form of a slit parallel to said capillary length.

10. A modulator according to claim 9, wherein said slit is about 0.04 mm wide and about 3 mm long.

11. A modulator according to one of claims 1 to 8, wherein each said nozzle is formed by a set of capillaries aligned in parallel to said capillary column length.

12. A modulator according to claim 11, wherein the upstream end of said capillaries open in a common CO₂ feeding duct, to which the capillaries are glued or soldered.

13. A modulator according to claim 12, wherein said capillaries each have an inner diameter of the order of 0.11 mm and each set forms a curtain having a length of about 3 mm.

14. A modulator according to one of the preceding claims, wherein said nozzle(s) is(are) inserted in a metal socket.

15. A modulator according to claim 14, wherein said socket is in the form of a brass tube.

16. A modulator according to one of the preceding claims, wherein said column length is mounted in stretched conditions.

17. Use of a modulator according to one of the claims 1 to 15 for modulating the solute fractions issued by a first chromatographic column and to be fed to a second chromatographic column in a comprehensive two dimensional gas chromatographic system.

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18. Use of a modulator according to one of the claims 1 or 2 and 8 to 16 for modulating the injected fractions immediately downstream the injector in a gas chromatographic system.

- 5 19. Use of a modulator according to one of the claims 1 or 2 and 8 to 16, for modulating the eluting fractions from a gas chromatographic column immediately upstream the detector of a gas chromatographic system.